Habitat Study Group Framework

CVP-SWP Operations Delta Smelt Fall Habitat Adaptive Management Program

The U.S. Fish and Wildlife Service has convened and chairs a Habitat Study Group (HSG) as specified in the CVP-SWP Operations (OCAP) biological opinion (BO) for implementation. The main functions of this group are to develop and carry out a habitat study plan, and to provide advice to help guide the Service's efforts to adaptively manage delta smelt habitat to sustain successful juvenile growth and development within the operational parameters set forth in the BO. The HSG will also support the peer review activities the Service will employ to ensure that the best available scientific information is used to carry out adaptive management as described in the BO's Reasonable and Prudent Alternative (RPA) Component 3.

Habitat Study Group Mission: The mission of the HSG is to provide for adaptive management of fall delta smelt habitat quality. Consistent with the requirements described in the BO, the adaptive management process will develop and use the best available scientific information to guide research, monitoring, assessment and reporting in a timely and transparent fashion; and shall include quantitative and clear performance measures.

The BO recognized and analyzed the effects of the Central Valley and State Water Project operations on delta smelt habitat during the fall (September through November). The Service provided a regulatory mechanism to address these effects through the RPA. The BO provided a clear understanding that there may be other means to avoid these adverse effects. Consequently, the RPA provides for targeted research and adaptive management of the action based on improved understanding of the scientific basis for the action and practical experience in implementing the action. After 10 years or sooner, the Service will conduct a comprehensive review of: the action, any new science supporting or refuting it, and the adaptive management program, to determine their efficacy. At this time, the Service will either: continue the action, modify it, or discontinue it depending on the outcome of this review.

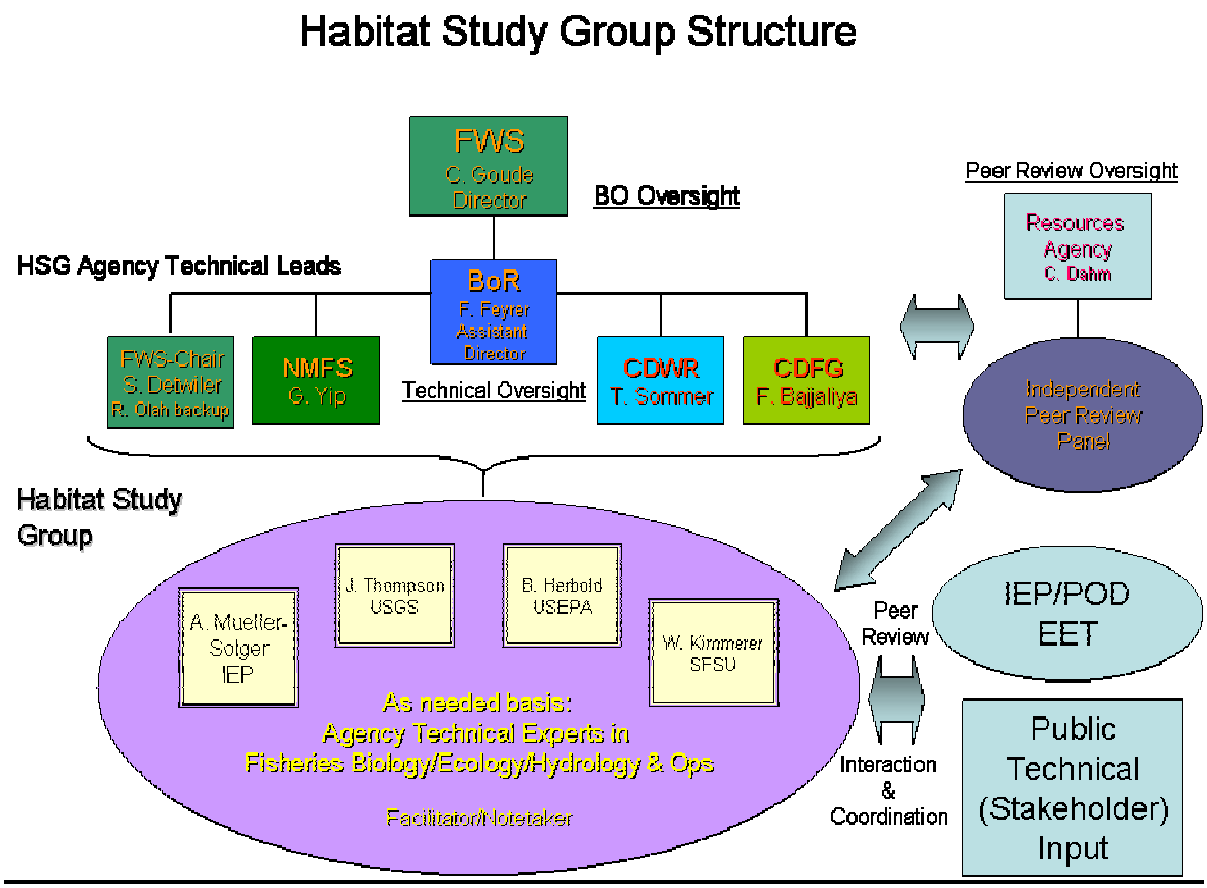
The HSG will complete an initial habitat study plan for peer review by September 30, 2009. This plan will detail monitoring, research, and other assessments the HSG believes are needed to support adaptive management of the fall delta smelt habitat action. The study plan must be approved by the Service with concurrence of the Bureau of Reclamation. In order to meet the aggressive timeline set forth in the BO, the HSG must be convened immediately, and provided sufficient resources to complete its task. Its work must focus on identifying and weighing the scientific merits of the most appropriate X2 action as prescribed in the RPA and other potential fall habitat actions using the highest standards of scientific rigor and objectivity.

The HSG must also develop research studies to clarify the mechanisms and processes that make fall habitat important to delta smelt, as well as performance measures and other

elements of the Service's adaptive management process. The Service believes that the framework and schedule outlined within this framework document provides for the necessary integrative and collaborative process to meet this scientific standard.

Organizational Structure

The core Habitat Study Group (HSG) will consist of scientists from the State and Federal agencies responsible for implementation of the adaptive management program (e.g., USFWS, USBR, CDFG, CDWR). In addition, scientists from associated agencies and organizations whose expertise and work is directly relevant to the activities of the group will also be engaged, as appropriate (e.g., NOAA-Fisheries, USEPA, IEP, DWR and USBR Hydrologic Ops). The technical work of the HSG will be implemented by a committee comprised of one technical lead each from USFWS, USBR, CDWR, CDFG, and NOAA-Fisheries, technical experts from other agencies and academia, and associated supporting expertise from appropriate scientific disciplines provided on an as-needed basis. The HSG will report directly to the Director (USFWS), who is responsible for oversight to ensure that the workgroup products are consistent with the provisions in the BO, and the Assistant Director (USBR), who is responsible for technical oversight. In addition, the Service will provide facilitation and support through an HSG chair. The HSG will be immediately assigned to convene beginning February 2009.



Background and Scope of HSG Responsibilities

The objective of RPA component 3 of the OCAP BO is to improve fall habitat for delta smelt through increasing Delta outflow during fall, based on the scientific opinion of the Service that increased outflow will increase fall habitat quality and quantity to benefit designated delta smelt critical habitat.

This regulatory action requires that during September and October in years when the preceding precipitation and runoff period was wet or above normal as defined by the Sacramento Basin 40-30-30 index, Reclamation and CDWR shall provide sufficient Delta outflow to maintain monthly average X2 no greater (more eastward) than 74 river km (from the Golden Gate) in Wet water years (WYs) and 81 km in Above Normal WYs. The monthly X2 target will be separately achieved for the months of September and October. During any November when the preceding water year was wet or above normal as defined by the Sacramento Basin 40-30-30 index, all inflow into CVP/SWP reservoirs in the Sacramento Basin shall be added to reservoir releases in November to provide an additional increment of outflow from the Delta to augment Delta outflow up to the fall X2 of 74 km for Wet WYs or 81 km for Above Normal WYs, respectively. In the event there is an increase in storage during any November this action applies, the increase in reservoir storage shall be released in December to augment the December outflow requirements in SWRCB D-1641.

For implementation of this component of the RPA, the Service must now direct an adaptive management process following guidelines in the process developed by Walters (1997), and utilizing existing initiatives and efforts (e.g., the IEP's POD investigation, Ecosystem Restoration Program for Delta Vision), where appropriate. In accordance with the adaptive management plan, the Service will review new scientific information when provided and may make changes to the RPA when the best available scientific information warrants. For example, there may be other ways to achieve the biological goals of this action.

The development and evaluation of alternatives that achieve the biological goals of the action is a main objective of the study. The fall habitat action may be modified by the Service consistent with the intention of this action if information provided by the HSG or other sources supporting the Service's adaptive management program provides sufficient supporting information to the Service that a change is warranted. The Service may also adjust the action in consideration of the needs of other listed species. Other CVP/SWP obligations may also be considered.

The Service will supervise the adaptive management program in order to ensure it is carried out in a timely fashion and is subject to adequate review. The program will be implemented as follows (some of the deadlines have not yet been established):

1) Develop a fall habitat conceptual model.
2) Develop a study plan intended to clarify the habitat conceptual model and the causative factors and mechanisms by which fall habitat quality is important for the rearing of juvenile delta smelt.
3) Formulate performance measures based on outcomes expected from implementation of the action as proposed in the RPA.
4) Implement the Study Plan.
5) Implement performance evaluation and any required new monitoring.
6) Peer review of the products developed in steps (2) through (5) above shall be completed before September 2009.
7) The Service shall review new scientific information developed by the HSG, scientific information reviewed by the HSG, or advice provided by the HSG on an ongoing basis, and may adapt the fall habitat action at any time if the strength and reliability of the information so warrant; the Service may also commission outside peer review of new information if in its view additional review is advisable.
8) The Service shall conduct a comprehensive review, including independent peer review of the outcomes of the Action and the effectiveness of the adaptive management program by December of 2019, or sooner.
9) At the end of 10 years (or as soon as sufficient scientific information indicates), this action, based on the peer review and Service determination as to its efficacy shall either be continued, modified or terminated.

Additional Discussion

According to Walters (1997), an adaptive management plan should include a clearly stated conceptual model, predictions of outcomes, a study design that can determine the results of actions, a formal process for assessment and action adjustment, and a program of periodic peer review. A conceptual model that is based on the best available scientific information underlying the present RPA is described in the Effects section of the BO. Expected outcomes are described in general terms below, though there is a high degree of uncertainty about the quantitative relationship between the size of the RPA described above and the expected increment in delta smelt recruitment or production.

The adaptive management plan will include the following new elements to ensure that performance measures and plans to evaluate the outcome of the Action are in place by the time it is implemented and that refinements to the Action can be developed as quickly as possible. These are listed in chronological order of implementation, but steps (1) through (7) are viewed as steps in an adaptive feedback loop that may cycle multiple times. The loop is closed when new information developed as a result of steps (4) – (6) and/or Service decisions to alter the RPA in (7) provide a basis for altering the conceptual model and/or study design in. The process will then continue, using adjustment of either the conceptual model (1) or study plan (2) as a re-entry step.

(1) HSG: The HSG must review and as necessary improve the habitat conceptual model, design performance measures for the RPA, and prepare a study plan to improve scientific understanding of delta smelt habitat. Studies implemented under oversight of the HSG may be conducted by the IEP agencies, academic institutions, or private parties at the discretion of the Service, the HSG, and the IEP agency coordinators. Documents produced by the HSG will be made publicly available by the Service. The Service will maintain an HSG page on its website to facilitate public access to its work, including key information and meeting notes (http://www.fws.gov/sacramento).

(2) Conceptual model review and preparation of study design: The conceptual model (summarized in the Effects section of the BO) describes multiple mechanisms potentially contributing to the observed habitat/flow relationship that motivates the fall action. The HSG will develop an improved conceptual model more clearly sorting out component mechanisms that may explain the observed relationship. At the discretion of the Service, the ambit of the conceptual model may be expanded to address habitat-related questions raised by the HSG. With the conceptual model in hand, two lines of investigation will be developed: one line will be designed to evaluate the performance of the specific action described above. The second line of investigation will address the scientific uncertainties underlying the relationship between summer/fall habitat conditions and its effect on delta smelt, which will provide new scientific information that may aid in refinement of the fall action.

(3) Performance evaluation of RPA Component 3: The HSG will develop performance measures for the RPA, and these measures will be subject to independent peer review. The performance measures to evaluate the present RPA will be implemented in accordance with its design by September 2009.

(4) New studies to better understand the habitat of delta smelt and identify the mechanistic linkages to apparent effects to the delta smelt population: The HSG will develop a habitat investigation to better understand the relationship of habitat quality to delta smelt rearing in the fall, and to identify mechanistic linkages to apparent population level response. The plan will be subject to independent peer review. There are several potentially fruitful lines of investigation to pursue, including studies to elucidate the precise mechanisms by which habitat affects delta smelt.

(5) Peer review: Studies conducted under the guidance of the HSG will be subject to independent peer review both at the design stage and after results are obtained and analyzed. Conclusions regarding the efficacy of the fall action and potential alternatives will also be independently peer reviewed prior to receipt for official consideration by the Service. The Service may also engage review of any scientific information developed by the investigation or offered to the Service during the investigation if, in the Service's opinion, other review has not adequately exhausted concerns about the quality or applicability of the information.

(6) Service review and RPA Component 3 adjustment: The Service will direct all stages of the adaptive management plan, and will adjust the RPA component 3 if/when circumstances and improved scientific understanding warrant. The HSG will provide technical assistance in the interpretation of results, but the Service will have ultimate responsibility for drawing conclusions regarding the advisability of any changes to the RPA. Decisions regarding whether or how to alter the action will ultimately be made by the Service. The Service will document any such decisions and make them available to the public.

The Service will conduct a comprehensive review of the outcomes of the RPA Component 3 and the effectiveness of the adaptive management program by December 2019, or sooner if circumstances warrant. This review will entail an independent peer review of the full history of the RPA. The purposes of the review will be (1) to evaluate the overall benefits of the RPA and (2) to evaluate the effectiveness of the adaptive management program. The outcome of this review might be a ratification of the action that is in place at the time of the review; it might also be a change in the action or discontinuation of the action. The Service will have sole authority to determine the outcome, and will document its decision and make the decision available to the public.